**To:** CN=Erin Foresman/OU=R9/O=USEPA/C=US@EPA[]
**Cc:** []
**From:** CN=Bruce Herbold/OU=R9/O=USEPA/C=US
**Sent:** Wed 8/15/2012 9:03:43 PM
**Subject:** Re: Help with latest version of comments to State Board

try this...I do feel like a prophet of doom...

Invasive species are a continuing and important problem in protecting aquatic resources in the SF Estuary. One invasive species that is certain to invade and become a problem in the near future are Dreissenid mussels – quagga and zebra mussels. A 2011 report by DWR used water chemistry to predict the future distribution of these mussels in the state. That report suggests that impacts will be greatest south of the Sacramento River because the Calcium and pH of Sacramento River water is inadequate to support shell-building by these animals. In San Joaquin River waters, impacts are more likely and should be anticipated now, before the problem becomes critical.

Based on experience gained in the invasion of these mussels into other North American waters, dreissenid mussels will affect phytoplankton growth in freshwater in much the same way that the Potamocorbula invasion affected phytoplankton growth in low salinity waters. They will also greatly affect fish screen effectiveness, at least until such screens are substantially improved. Therefore, EPA recommends the Board protect aquatic resources by mandating immediate adoption of suitable fish screens in the south delta and/or developing alternative methods for meeting water quality standards in the event of invasions, probably by further restricting the number of fish entrained once the mussels impair the present screens. The impacts of dreissenid mussels may require changes in flows that protect estuarine and freshwater habitats, but suitable responses will have to rest upon site specific studies of impacts once they have invaded. Implementation of such studies should be identified as a priority now so that baseline data can be gathered and increased monitoring efforts can be ready for immediate response. Dreissenid invasion is likely to be fast and severe, and the scientific and management response will need to be similarly rapid and intense. Claudi, R and K.Prescott_2011 Examination of Calcium & pH as Predictors of Dreissenid Mussel Survival in the California State Water Project available at: http://www.water.ca.gov/environmentalservices/docs/Claudi_Prescott_2011_Examination_of_Calcium_pH_as_Predictors_of_Dreissenid_Mussel_Survival_in_the_CA_SWP.pdf

Bruce Herbold
USEPA Fish Biologist
(415) 972 3460

"If 90% of the ideas you generate aren't absolutely worthless, then you're not generating enough ideas". -- Michael Artin